Galactomannans from novel sources blended with collagen as edible coatings for fruits

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The biggest losses (25 % to 80 %) in the quality and amount of fresh fruits occur between their harvest and consumption. Further, one of the most important problems in fruit conservation is their short shelf life. Preservation can be extended by reducing respiration and transpiration rates. This is done by controlling factors such as temperature, relative humidity, gas composition, light and mechanical/physical stress.

The galactomannan films and coatings have a no greasy/oily aspect, together with a low caloric content. They became popular in the agriculture due to their permeability to CO_2 and/or O_2. On the other hand, collagen coatings have been used on meats and sausages to reduce gas and/or water vapour permeability. Blending has become an economical and versatile way to obtain materials with a wide range of desirable properties.

In this work galactomannan/collagen blends were studied as coatings from mango and apple fruits. The galactomannans were extracted from *Caesalpinia pulcherrima* and *Adenathera pavonina* and mixed with collagen and glycerol. These new galactomannans have mannose:galactose ratios between 2:1 and 3:1, which significantly improve their mechanical properties when used as coatings.

The work started by characterizing the surface properties of the fruits and the wetting capacity of the coatings (as determined by the sessile drop method) as well as the fruits respiration rate (determined by measurement of O_2 - with an O_2 electrode and CO_2 – by gas chromatography – in a chamber).

The coating composition which presented the best values of wettability was identified for each of the fruits under consideration. Such coatings were characterized in terms of their water vapor, O_2 and CO_2 permeability values.

Results have shown that it is possible to coat mango and apple with galactomannan/collagen blends. However, further research must be undertaken to improve the mechanical properties of these new materials.

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